Abstract

The share of patents held by the universities reflects the strength of technological research of any nation. Despite legislative encouragement provided in most countries for universities to patent their research, academic patents form only a small volume of patents filed in any country. Universities do not seem to patent most of their research. This situation is exacerbated in the case of India, where only 0.7% of the patents during the period 2003 – 05 were owned by the universities. This concern led to the current study of probing the patenting behaviour of faculty.

From extant literature, we found that most of the research in academic patenting was either at university level or national level and the conclusions were based on econometric analyses of secondary data. A major limitation of those studies was that, they assume individual characteristics as constant. The contribution of this study is to relax the above mentioned assumption and focus on studying the impact of individual characteristics of faculty on their patenting behavior.

The thesis has three main objectives, namely

a. To develop a model of academic patenting behavior with academic inventors as the focus.
b. To deduce individual characteristics that distinguishes an academic patentee from an academic non patentee.

c. To provide insightful suggestions to administrators at universities for intellectual property management policies and practices, along with talent management practices to enable patenting behavior.

We modeled patenting behavior at the individual level as being influenced by demographic variables such as designation, prior industrial experience and behavioral variables, namely, attitudes towards patenting, situational awareness of support for patenting, personality traits like resilience and creative personality traits and motives like monetary, fame and prosocial motives.

Initially, eight academic patentees were interviewed to arrive at individual characteristics requiring study. We combined the behavioral characteristics derived from the content analysis of the initial study with our insights from the gaps in the existing literature and designed a questionnaire. The questionnaire aimed at measuring seven behavioral variables along with collecting information on demographic details. The seven behavioral variables included in our study are creative personality traits, resilience, attitudes towards patenting, situational awareness of support for patenting, monetary motives, fame motives and prosocial motives.

The main study was conducted using survey research design. We contacted 1200 faculty from Indian Institute of Science, Indian Institute of Technology Delhi, Indian Institute of Technology Bombay, Indian Institute of Technology Kanpur, Indian Institute of Technology Madras and Indian Institute of Technology Kharagpur initially through e-mail and later in person. We used data provided by a sample of 249

faculty members for the analyses. In the sample, 115 are academic-patentees and 134 are academic-non-patentees.

We attempted to determine individual characteristics that distinguish an academic-patentee from an academic-non-patentee. The results from our study indicated that in academic patentees there was a statistically significant correlation between prosocial motive and situational awareness of support patenting. While in the case of academic non patentees, there was a significant correlation between fame motive and monetary motive.

Using t-test, we were able to conclude that academic patentees differed significantly ($p < 0.01$) from academic non patentees in their attitude towards patenting and in their situational awareness of support for patenting. We found that both the academic patentees and academic non patentees were high in resilience and did not differ from each other significantly. When we looked into differences in motives we found that academic patentees differed significantly ($p < 0.01$) in their prosocial and monetary motives. Both the groups were high on fame motives and did not differ significantly from each other.

Based on results of chi-square tests of the 28 creative personality traits, we could conclude that academic patentees differed significantly from academic non patentees ($p < 0.01$) in describing themselves as unconventional and inventive.

We found that our model of patenting behavior that included demographic variables like age and prior industrial experience along with behavioral variables like attitudes towards patenting, situational awareness of support for patenting and being unconventional explained maximum variance (Nagelkerke $R^2 = 0.48$). We were able

to classify 78% of the sample correctly into academic patentees and academic non patentees. The Wald criterion demonstrated that all the predictors made significant contribution to prediction.

We were able to establish the importance of predictors in determining patenting behavior. We found designation as the most important predictor among those included in our study. Other things being equal, the odds of a Professor or an Associate Professor being a patentee was 5.6 times more than those of an Assistant Professor. We found the creative personality trait "unconventional" as the second most important predictor. The odds of faculty who describe themselves as "unconventional", being a patentee was 4.5 times more than those who do not describe themselves as unconventional. The third important predictor was prior industrial experience (odds ratio: 1.9), the fourth and the fifth being situational awareness of support for patenting (odds ratio: 1.3) and attitudes towards patenting (odds ratio: 1.2), respectively. Thus to conclude, we found that both demographic and behavioral factors influence the patenting behavior.

Our revised model of academic patenting indicates that two types of advantages have positive influence on academic patenting behavior at the individual level. We named them as experience advantage and psychological advantage. Experience advantage is gained as a result of increased academic experience and increased industrial experience. The psychological advantage results when an academic inventor, as an individual is "unconventional", has positive attitude towards patenting and is aware about support available for patenting to a large extent.

Based on our research, we suggest intellectual property management practices and talent management practices that are likely to increase the patenting behavior of academic inventors. Attitude towards patenting can be improved by making patenting experience more positive and by providing more assistance for patenting through the Intellectual Property Cell / Technology Transfer Office. Increasing awareness of support for patenting can be promoted by making available information on government funding agencies and industrial partners who would support in patent filing and in commercializing patents. Such information not only prevents the pile up of unutilized academic patents but also encourages the faculty to continue to engage in patenting behavior. Academic patenting behavior can also be facilitated through promoting organizational culture that encourages their members to be "unconventional". The limitations of the study and suggested future research are also described in the thesis.